

WHAT IS CLAIMED IS:

1. A method of manufacturing semiconductor devices, comprising the steps of:

5 forming a plurality of gates on a semiconductor substrate;

 forming an insulation layer on an entire surface of the semiconductor substrate to coat the plurality of gates;

 selectively removing the insulation layer by using a first mask pattern to form a contact hole, which exposes a source/drain junction and a conductive layer in a portion of the gates in the
10 semiconductor substrate;

 removing the first mask pattern and forming a second mask pattern on the selectively removed insulation layer, the second mask pattern exposing the p+ source/drain junction in the
15 semiconductor substrate;

 implanting ion into the p+ source/drain junction in the semiconductor substrate by using the second mask pattern as a mask;

 removing the second mask pattern and rapid thermal annealing
20 the entire substrate in a activation temperature range of dopant which is implanted in the ion implantation step; and

 burying the contact hole with conductive material to form a bit line contact plug.

2. The method of manufacturing semiconductor devices according to claim 1, wherein the ion implantation step is performed with the dose of $4.5 \sim 6 \times 10^{15}$ atoms/cm².

5 3. The method of manufacturing semiconductor devices according to claim 1, wherein the ion implantation step is performed with the energy of 10~24keV.

10 4. The method of manufacturing semiconductor devices according to claim 1, wherein a tilt angle is adjusted in a range of about 0 to 60 degrees in the ion implantation step.

15 5. The method of manufacturing semiconductor devices according to claim 1, wherein an orientation is adjusted in a range of about 0 to 90 degrees in the ion implantation step.

20 6. The method of manufacturing semiconductor devices according to claim 1, wherein rotation is adjusted within four times in the ion implantation step.

7. The method of manufacturing semiconductor devices according to claim 1, wherein the rapid thermal annealing is performed at a temperature of 830°C or less.

8. The method of manufacturing semiconductor devices according to claim 7, wherein the rapid thermal annealing uses 1 to 25slm N₂ gas as purge gas.

5 9. The method of manufacturing semiconductor devices according to claim 7, wherein the rapid thermal annealing is performed at a heating rate of about 10 to 100°C/sec.